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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,377	08/06/2001	Shaun S. Wang	39172.00.0006	8932
23418 7590 05/23/2007 VEDDER PRICE KAUFMAN & KAMMHOLZ 222 N. LASALLE STREET CHICAGO, IL 60601			EXAMINER LIVERSEDGE, JENNIFER L	
			ART UNIT 3692	PAPER NUMBER
			MAIL DATE 05/23/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

09/923,377

**Applicant(s)**

WANG, SHAUN S.

**Examiner**

Jennifer Liversedge

**Art Unit**

3692

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 42-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 42-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                                    |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                               | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/25/2007</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Election/Restrictions***

In response to the requirement for Election/Restriction, Applicant has elected the claims associated with Group 1. While the response to Examiners requirement for Election/Restriction refers to an election of Group 1, claims 1-20, Examiner clarifies that Group 1 consists of the method claims 1-20 and the associated computer-readable medium claims 42-61. Therefore, for purposes of examination, claims 1-20 and 42-61 will be examined in the present Office Action.

Notice of Non-Compliant Amendment: the current amendment remains non-compliant. Claims 24, 25, 26, 28, 30 are missing status identifiers.

### ***Specification***

The abstract of the disclosure is objected to because:

The third line states to "...underwritten risk in...". Examiner believes this should read "...underwritten risk in...".

The seventh line states to "...risk-transfer, other grouped or...". Examiner believes this should read "...risk-transfer, whether grouped or...".

Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities:

The Specification refers the reader to multiple Tables, and columns within the table as means of explanation of material within the Specification. However, the Tables are not provided. Tables referenced in the Specification should be placed in the Drawings section.

Appropriate correction is required.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a) because they fail to show multiple Tables, and columns therein, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are

not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 and 42-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following rejections refer to claims 1 and 42:

Step b refers to assembling a series of potential future cashflow outcomes. It is unclear what cashflow outcomes are being referred to, whether the cashflow outcomes are related to the assets and liabilities of Step a or whether the cashflows are random or related to other unstated reference point.

Step d refers to cumulating the probabilities. It is unclear whether referred to probability relates back to the paired probabilities of step b. If so, consistent language should be used. The reference to the last cumulative probability is unclear. What is the last? How does the user or reader know which is last?

Step e contains a statement of intended use, where "what is being done" is in the second portion of the paragraph and "how it's being done" is in the first portion of the paragraph, resulting in a lack of clarity of what is exactly is being claimed. This could be

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overcome by stating the language, for example, as “computing individual inversely-mapped results by applying the inversion of the standard normal distribution to all cumulative probabilities”.

Step f refers to selecting a lambda value. The reference to the selection of a lambda value is unclear. What is the lambda value? How would a user or reader make a lambda selection? Additionally in Step f, it would be more clear to refer to “the selected group of assets and liabilities” rather than “the group of assets and liabilities”.

Step g includes a statement of intended use and can be addressed in the same manner as suggested for Step e. For example, “add the selected lambda value to each inversely-mapped result to obtain a shifted inversely-mapped result.

Step h includes a statement of intended use and can be addressed in the same manner as suggested in Steps e and g.

Step i refers to decumulating. The reference to decumulating is unclear. Additionally, the reference to the “first decumulated weight” and “last decumulated weight” is unclear. What is the first and the last? How does the user or reader know which is first and last?

Step j includes a statement of intended use and can be addressed in the same manner as suggested in Steps e and g.

Step k includes a statement of intended use and can be addressed in the same manner as suggested in Steps e and g.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-20 and 42-61 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The steps of the method and computer-readable medium end with the calculation of a price. However, there is no real-world, concrete and tangible result associated with the calculation of a price. Examiner suggests that to resolve the 35 U.S.C. 101 issue, an amendment to the claim language including a step of displaying the price or providing a report with the price, etc. would be adequate in providing a real-world, concrete and tangible result to the steps as indicated. Re-wording the claim language to overcome the 101 and 112 issues could be accomplished by stating, for example, "Computing and displaying an undiscounted price for the selected group of assets and liabilities by adding the weighted values in the set".

***Allowable Subject Matter***

Claims 1-20 and 42-61 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101 and 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest the limitations of the independent claims.

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Independent claim 1 discloses a computer-implemented method for pricing, with adjustment for risk, of anticipated contract obligations comprising the steps of:

- a) selecting a group of assets and liabilities,
- b) assembling a series of potential future cashflow outcomes, with their respectively paired probabilities,
- c) sorting the series of outcomes by their ascending cashflow values,
- d) cumulating the probabilities of the sorted series of outcomes so that the last cumulative probability equals 1,
- e) applying the inversion of the standard normal distribution to all cumulative probabilities, to provide individual inversely-mapped results,
- f) selecting a lambda value as the market price of risk for the group of assets and liabilities,
- g) shifting each inversely-mapped result by adding the selected lambda value,
- h) applying the standard normal cumulative distribution to each shifted result, to create transformed cumulative probability weights,
- i) decumulating the transformed cumulative probability weights so that the first decumulated weight equals the first cumulative weight, the second decumulated weight equals the second cumulative weight minus the first cumulative weight, the third



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decumulated weight equals the third cumulative weight minus the second cumulative weight, and so on, continuing until the last decumulated weight equals the last cumulative weight minus the next-to-last cumulative weight,

j) multiplying the cashflow values to their respective decumulated probability weights to produce a set of weighted values, and

k) adding the weighted values in the set to find an undiscounted price for the selected group of assets and liabilities.

Dependent claims 2-20 would be allowable as they follow from independent claim 1.

Independent claim 42 discloses a computer-readable medium for use with a computer means for pricing, with adjustment for risk, of anticipated contract obligations comprising the steps of:

- a) selecting a group of assets and liabilities,
- b) assembling a series of potential future cashflow outcomes, with their respectively paired probabilities,
- c) sorting the series of outcomes by their ascending cashflow values,
- d) cumulating the probabilities of the sorted series of outcomes so that the last cumulative probability equals 1,
- e) applying the inversion of the standard normal distribution to all cumulative probabilities, to provide individual inversely-mapped results,

f) selecting a lambda value as the market price of risk for the group of assets and liabilities,

g) shifting each inversely-mapped result by adding the selected lambda value,

h) applying the standard normal cumulative distribution to each shifted result, to create transformed cumulative probability weights,

i) decumulating the transformed cumulative probability weights so that the first decumulated weight equals the first cumulative weight, the second decumulated weight equals the second cumulative weight minus the first cumulative weight, the third decumulated weight equals the third cumulative weight minus the second cumulative weight, and so on, continuing until the last decumulated weight equals the last cumulative weight minus the next-to-last cumulative weight,

j) multiplying the cashflow values to their respective decumulated probability weights to produce a set of weighted values, and

k) adding the weighted values in the set to find an undiscounted price for the selected group of assets and liabilities.

Dependent claims 43-61 would be allowable as they follow from independent claim 42.

The primary difference between the claimed invention and the prior art is the applicability of the model to all probability distributions (rather than just normal or lognormal distributions), and the applicability to blending of assets and liabilities with both negative and positive values (rather than assets only which cannot be negative in

value), in which the particular calculations are performed as outlined above taking into account these factors.

Prior art discloses the simulation of valuation of financial instruments (US Patent No. 6,061,662 to Makivic). Makivic discloses determining a price using a probability density calculated from historical data, in which a Metropolis algorithm is used to sample from the probability density, wherein the Monte Carlo simulation is based on a risk-neutral valuation, and wherein the price depends on a vector of state variables that is assumed to follow a Markov process. Further, the predetermined distribution is selected from Gaussian, Cauchy, Poisson jump, a combination thereof, as well as a histogram of historical data. The calculations for pricing are based on inputs related to assets. However, Makivic does not follow the calculation steps as details above as steps a- k; Makivic does not specify that the model is applicable to all probability distributions; and Makivic does not disclose where the model is applicable to liabilities as well as assets.

Further, prior art discloses determining optimal asset allocation utilizing simulation of cash flow (US Patent No. 6,055,517 to Friend et al.). Friend discloses simulating future cashflows for an asset allocation in order to avoid risks, in which a user defines weights to avoiding risk and maximizing rates of return. However, Friend does not follow the calculation steps as details above as steps a- k; Friend does not

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specify that the model is applicable to all probability distributions; and Friend does not disclose where the model is applicable to liabilities as well as assets.

Additional prior art (US Patent No. 6,360,210 B1 to Wallman) discloses managing risk is a portfolio of assets and liabilities. Wallman discloses a pricing mechanism that examines the risk for a given portfolio and prices the risk. Both assets and liabilities are input into the system and the system processes prices for shielding the portfolio from market risk. The pricing is performed and analyzed using value-at-risk and sensitivity algorithms and probabilistic analysis in computing the shielding cost. The analysis is disclosed as being capital asset pricing models, modern portfolio theory models, value-at-risk and sensitivity models for valuing portfolios. However, Wallman does not follow the calculation steps as details above as steps a- k and Wallman does not specify that the model is applicable to all probability distributions.

Non-patent literature published by the applicant of the current application includes "Insurance pricing and increased limits ratemaking by proportional hazards transforms" (Shaun Wang, 1995). In this paper, Wang discloses a risk-adjusted premium for pricing risks based on the proportional hazards (PH) transform. While the author concludes a method to calculate risk-adjusted premiums, which "can be used to equalize the risk loading for different risk classes or different lines of insurance", the author does not disclose the calculation steps as details above as steps a- k; nor

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specify that the model is applicable to all probability distributions; nor does the author disclose where the model is applicable to liabilities as well as assets.

### ***Conclusion***

Any inquiry concerning this communication should be directed to Jennifer Liversedge whose telephone number is 571-272-3167. The examiner can normally be reached on Monday – Friday, 8:30 – 5 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Fischer can be reached at 571-272-6779. The fax number for the organization where the application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jennifer Liversedge

Examiner

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